

PULL-ON DISPOSABLE DIAPER

BACKGROUND OF THE INVENTION

This invention relates generally to pull-on disposable diapers and the like.

Pull-on disposable diapers are well known. To improve

a ~~a fitting of such diaper to the wearer's body, waist-opening~~ fit the
~~such~~ ~~at~~ and the leg-openings of the diaper have been provided in the ~~at~~

a proximity of their peripheral edges ~~with elastic members~~
~~bonded thereto in their longitudinally extended conditions,~~

a ~~A body~~ ~~Body~~ fluid absorbent core of the diaper is disposed between
a liquid-permeable sheet and a liquid-impermeable sheet so as

a to extend across a crotch region, from a front waist region ~~of the diaper~~

a into a rear waist region ~~of the diaper~~ ~~thereof~~ ~~As viewed vertically~~

a ~~Longitudinally~~ ~~of the diaper~~ ~~longitudinally~~ opposite ends of the absorbent

a core lying in the front and rear waist regions, respectively, ~~of the diaper~~
a underlie the elastic members associated with the waist-
a opening.

a The pull-on diaper is apt to slip down ~~more or less~~ during use. While it is possible to pull up the pull-on

a diaper by holding an edge of the waist-opening, even such ~~a~~ ~~simple~~ ~~operation~~ is often difficult for the ~~aged~~ ~~elderly~~ and the

a sick. Although it is often relatively easy to pull up a

a front side of the diaper, it is often difficult for the ~~aged~~ ^{elderly} and sick to hold a rear side of the diaper with his or her hands and thereby ~~to~~ pull up the rear side. In such a case, ^{the} ~~that~~ wearer's hips might be left exposed.

SUMMARY OF THE INVENTION

a In view of the problem as ~~has been~~ described above, it is a principal object of the invention to provide a diaper so improved that unintentional exposure of the wearer's hip can be minimized even if the diaper more or less slips down.

The object set forth above is achieved, according to the invention, by a pull-on disposable diaper comprising an absorbent including a liquid-permeable topsheet, a liquid-impermeable backsheet and an absorbent core disposed ^{the diaper thereby} therebetween, ~~and~~ having a front waist region, a rear waist region and a crotch region extending therebetween, ^A ~~and a~~ ^{the} waist-opening and a pair of leg-openings defined by ^{the} ~~said~~ respective regions ~~wherein said waist opening and said leg~~ ^{which are} ~~openings~~ are provided with elastic members ~~being~~ stretchable ^{the} circumferentially of ~~said~~ respective openings and bonded in ~~stretched~~ ^{thereto. The} ~~longitudinally extended~~ ~~conditions thereof,~~ ~~said~~ disposable ^{is} diaper being characterized in that ~~said~~ elastic members ^{the} associated with ~~said~~ waist-opening extend across ~~said~~ front

and rear waist regions substantially at the same ^{vertical} level
vertically of said diaper; and said absorbent core has a
front end in said front waist region and a rear end in said
rear waist region. The front end lies below said elastic
members associated with the waist-opening and said absorbent
core ~~extends~~ extending, in said rear waist region, upward beyond said
elastic members associated with the waist-opening so that
the absorbent core has a rear end lying above said elastic
members associated with the waist-opening.

The pull-on disposable diaper according to the invention ~~allows~~ ^{minimizes} an unintentional exposure of the wearer's hip ~~to be minimized~~ since a depth of the rear waist region down to the crotch region is dimensioned ~~so as~~ to be significantly larger than that of the front waist region.

Other and further objects, features and advantages of the invention will appear more fully from the following description.



BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view showing an embodiment of a pull-on diaper according to the invention as partially broken away;

Fig. 2 is a plan view showing the diaper unfolded back

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and forth from its state shown in Fig. 1, as partially broken away;

Fig. 3 is a sectional view taken along a line III-III in Fig. 2;

Fig. 4 is a sectional view taken along a line IV-IV in Fig. 2;

Fig. 5 is a sectional view taken along a line V-V in Fig. 2;

Fig. 6 is a view similar to Fig. 4 illustrating an alternative embodiment of the invention; and

Fig. 7 is a view similar to Fig. 5 illustrating the alternative embodiment of the invention.



DESCRIPTION OF THE PREFERRED EMBODIMENTS

A pull-on or shorts type disposable diaper shown by Fig. 1 in a perspective view as partially broken away basically comprises a supporter 1 in the form of shorts and an absorbent 2. The supporter 1 is composed of a front waist region 6, a rear waist region 7 and a crotch region 8 extending between the front and rear waist regions 6, 7. These front and rear waist regions 6, 7 are put flat and bonded together along their transversely opposite side edges at vertically intermittent spots 10 so as to form right and

left closed side edges 13 of the waist regions, a waist-opening 14 and a pair of leg-openings 16. The supporter 1 is made of a laminated sheet 19 comprising a liquid-impermeable plastic film serving as a topsheet 17 and an air-permeable spun-bond nonwoven fabric serving as a backsheet 18. The waist-opening 14 and the leg-openings 16 are respectively provided in the proximity of their peripheral edges with a plurality of elastic members 21, 22 which are stretchable circumferentially of their openings, respectively. These

a elastic members 21, 22 each ~~having~~ ^{have} ~~and~~ a width of 0.5 ~ 3mm ^{and} are laid between the topsheet 17 and the backsheet 18 and bonded *a* in their ~~longitudinally extended~~ ^{stretched} conditions to an inner surface of at least one of the topsheet 17 and the backsheet 18. Referring to Fig. 1, the elastic members 21 associated with the front and rear waist regions 6, 7 extend across these waist regions 6, 7 substantially at the same level above the bottom of the crotch region 8. Below the elastic members 21, the front and rear waist regions 6, 7 are additionally provided with a plurality of second elastic members *a* 23. These second elastic members 23 each ~~having~~ ^{have} a relatively ^{and} large width of 3 ~ 10mm ^{and} are stretchable circumferentially of the waist regions and bonded in their ~~longitudinally extended~~ ^{stretched} conditions to an inner surface of at least one of the

topsheet 17 and the backsheets 18. As shown, an upper end 27 of the rear waist region 7 sufficiently extends upward beyond the elastic members 21 to overlie an upper end 26 of the front waist region 6.

Fig. 2 is a plan view showing, as partially broken away, the diaper having the front and rear waist regions 6, 7 cut apart along the side edges 13 and longitudinally unfolded from the state shown in Fig. 1. Fig. 3 is a sectional view taken along a line III-III in Fig. 2 which divides the diaper in two longitudinally. As will be apparent from Fig. 2, the supporter 1 is substantially hourglass-shaped while the absorbent 2 is T-shaped and extends across the front and rear waist region 6, 7 and the crotch region 8 of the supporter 1. A front end 31 of the absorbent 2 ~~ties~~ ^{extends} in the front waist region 6 of the supporter 1 and terminates ~~on this side~~ ^{inwardly} of the elastic members 21. A rear end 32 ^{of absorbent 2} which is transversely enlarged ^{or} relative to the front end 31 ~~ties in the rear waist region 7~~ and extends beyond ^{or} ~~outwardly of~~ the elastic members 21.

The absorbent 2 comprises a topsheet 36 made of a liquid-permeable spun-bond nonwoven fabric, a backsheets 37 made of a liquid-impermeable plastic film and a liquid-absorbent core 38 disposed between the topsheet 36 and the

comprises
a backsheet 37 and ~~comprising~~ fluff pulp fibers or a mixture of fluff pulp fibers and super-water-absorptive polymer particles. The backsheet 37 is bonded to the topsheet 17 of the supporter 1 by means of hot melt adhesive (not shown). The absorbent 2 is provided along its transversely opposite side edges extending in the proximity of the crotch region 8 with a pair of barrier cuffs 39 extending longitudinally of the absorbent 2. Each of the barrier cuffs 39 comprises a liquid-impermeable strip extending longitudinally of the diaper, which has one side edge 41 bonded to the backsheet 37 and the other side edge 42 extending in parallel to the side edge 41 and folded inwardly of the diaper. Each side edge 43 of the topsheet 36 is bonded to the barrier cuff 39 along its area defined between the side edges 41, 42. The side edge 42 folded inwardly of the diaper contains an elastic member 44 bonded in its longitudinally extended condition to an inner surface of the folded side edge 42. An inner surface of the barrier cuff 39 is bonded at its longitudinally opposite ends 46, 47 (Fig. 2) to an upper surface of the topsheet 36 by means of hot melt adhesive (not shown). With the diaper being in the state shown by Fig. 1, the elastic member 44 contracts and, in consequence, an intermediate portion of the barrier cuff 39 extending between the longitudinally opposite

ends 46, 47 rises on the topsheet 36 so as to define a pocket which opens inwardly of the diaper. The absorbent core 38 has a plurality of parallel notches 51 extending ^{inward} ~~forward~~ (i.e., downward as viewed in Fig. 1) from a rear end 49 and these notches 51 allow the absorbent core 38 to be smoothly curved along the wearer's waist.

Figs. 4 and 5 are sectional views taken along lines IV-IV and V-V in Fig. 2, respectively. The topsheet 36 and the backsheet 37 covering the absorbent core 38 are bonded along their portions extending outward beyond a peripheral edge of the absorbent core 38 and placed upon each other. In the front waist region 6, the topsheet 17 and the backsheet 18 of the supporter 1 are folded along the front end 26 of the supporter 1 inwardly of the diaper and partially cover the absorbent 2. The topsheet 17 folded in this manner is bonded to the backsheet 18 folded together with the topsheet 17, on ^{the} ~~one~~ hand, and bonded to the topsheet 36 of the absorbent 2, on the other hand (Fig. 4). In the rear waist region 7, the topsheet 17 and the backsheet 18 are folded along the rear end 49 of the absorbent core 38 inwardly of the diaper and bonded to the topsheet 36 (Fig. 5). The arrangement that both the front end 31 and the rear end 32 of the absorbent 2 are covered with the topsheet 17 and the backsheet 18 assures

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that the wearer is free from an uncomfortable feeling of wetness even if body fluids spread to the front and rear ends 31, 32.

Figs. 6 and 7 are views similar to Figs. 4 and 5, respectively, showing still another alternative embodiment of the invention. Referring to Figs. 6 and 7, the topsheet 17 and the backsheet 18 of the supporter 1 ~~longitudinally extend~~ ^{extend longitudinally} without being folded and the absorbent 2 merely rests on these topsheet 17 and the backsheet 18. Obviously, the absorbent 2 is bonded to the supporter 1 and the absorbent 2 ^{However, the arrangement} might shift relative to the supporter 1. ^{Arrangement} illustrated by Figs. 6 and 7 is simpler than that illustrated by Figs. 4 and 5 and ^{the} ~~a~~ manufacturing cost of the diaper can be correspondingly reduced.

It should be understood that the arrangements of the front waist region 6 illustrated by Figs. 4 and 6 and the arrangements of the rear waist region 7 illustrated by Figs. 5 and 7 may be selectively combined.

In the diaper configured as ~~has been~~ described herein above, the topsheet 17 and the backsheet 18 of the supporter 1 are not limited to those ~~as~~ illustrated and it is not critical whether they comprise liquid-permeable sheets or liquid-impermeable sheets. The topsheet 36 of the absorbent

2 also is not limited to the liquid-permeable nonwoven fabric and it is possible to replace this by a liquid-permeable plastic film. For implementation of the invention, bonding of various components such as the topsheet 17 and the backsheet 18 of the supporter 1 as well as the topsheet 36 and the backsheet 37 of the absorbent 2 may be achieved not only by use of suitable adhesive such as hot melt adhesive but also by use of the known heat-sealing technique so long as any one or more of these sheets are of heat-sealable nature.

While the invention has been described hereinabove in connection with the pull-on disposable diaper basically comprising the supporter 1 in the form of shorts and the absorbent 2, the invention may be implemented by using the liquid-permeable topsheet 17 and the liquid-impermeable backsheet 18 to form the supporter 1 in the form of shorts and by disposing the T-shaped absorbent core 38 between these two sheets 17, 18.

The entire disclosure of Japanese Patent Application No. Hei8-294096 filed on November 6, 1996 including specification, claims, drawings and abstract are incorporated herein by reference in its entirety.

Having described our invention as related to the

embodiment shown in the accompanying drawings, it is our intention that the invention be not limited by any of the details of description, unless otherwise specified, but rather be construed broadly within its spirit and scope as set out in the accompanying.

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